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Journal of the Society of Arts.

FRIDAY, AUGUST 20, 1858.

BOARD OF ARTS AND MANUFACTURES,
CANADA.

By a statute of the Canadian Legislature, passed last year, reciting that it is "desirable to promote the development of mechanical talent among the people of this Province, by disseminating instruction in mechanics and the kindred sciences, and by affording increased facilities for the study of models and apparatus; and" that "for the attainment of this object by these means, it is expedient to provide for the establishment of Central Boards of Administration in Upper and Lower Canada respectively, connected and co-operating with the Mechanics' Institutes of the several cities, towns, and villages in the pursuit thereof; and to extend encouragement to arts and manufactures, and stimulate the ingenuity of mechanics and artisans by means of prizes and distinctions, distributed and awarded on the same principle as has been already so successfully applied to the encouragement of agriculture in this Province," two "Boards of Arts and Manufactures," one for Upper Canada and the other for Lower Canada, have been established. These Boards are created corporate bodies, and consist of the Minister of Agriculture for the time being (who shall be *ex officio* a member of each), of the Professors of and Lecturers on the various branches of physical science in all the chartered Universities and Colleges in Upper and Lower Canada respectively, and the Chief Superintendents of Education in Upper and in Lower Canada respectively for the time being, *ex officio*, the Presidents for the time being of and one Delegate from each of the Boards of Trade, and the Presidents of and Delegates from each of the incorporated Mechanics' Institutes, or of any incorporated Arts Associations.

Each incorporated Mechanics' Institute in Upper and Lower Canada respectively elects and accredits to the Board of Arts and Manufactures in each Province respectively one delegate for every twenty members on its roll, being actual working mechanics or manufacturers, and having paid a subscription of at least five shillings each to its funds for the year then last past; provided that no such Mechanics' Institute shall be entitled to elect and accredit any such delegate to the Board of Arts and Manufactures, unless it shall have paid and contributed to the funds of such Board, at least one-tenth of the amount of Government aid granted to such Institute during the year then last past.

The duties of these Boards of Arts and Manufactures are to take measures, with the approbation of the Minister of Agriculture, to collect and establish at Toronto and Montreal respectively, for the instruction of practical mechanics and artisans, museums of minerals and other material substances and chemical compositions, susceptible of being used in mechanical arts and manufactures, with model rooms appropriately stocked and supplied with models of works of art, and of implements and machines (other than implements of husbandry and machines adapted to facilitate agricultural operations) and free libraries of reference, containing books, plans, and drawings, selected with a view to the imparting of useful information in connection with mechanical arts and manufactures, to take measures to obtain from other countries new or improved implements and machines (not being implements of husbandry or machines specially adapted to facilitate agricultural operations), to test the quality, value, and usefulness of such implements and machines, and generally to adopt every means in their power to promote improvement in the mechanical arts and in manufactures in the Province; and the Minister

of Agriculture may cause duplicates or copies of models, plans, specimens, drawings, and specifications deposited in the Patent Office, and upon which Patents of Invention have issued, to be made, from time to time, and placed in the model rooms, museums, or libraries of the said Boards of Arts and Manufactures respectively; and it shall be lawful for the said Boards respectively, with the consent and approbation of the Minister of Agriculture, to establish in connection with their respective museums, model rooms or libraries, schools of design for women, on the most approved plan, and furnished and supplied in the most complete and appropriate manner that the funds at their disposal may admit of, regard being had to the claims thereon of the other objects for which they are hereby established; and also to found schools or colleges for mechanics, and to employ competent persons to deliver lectures on subjects connected with the mechanical arts and sciences or with manufactures; and the said Boards shall keep records of their respective transactions, and shall from time to time publish, in such manner and form as to secure the widest circulation among the Mechanics' Institutes, and among mechanics, artisans and manufacturers generally, all such Reports, Essays, Lectures, and other literary compositions conveying useful information, as the said Boards respectively may be able to procure, and judge to be suitable for publication. The members of the Boards of Agriculture and of the Boards of Arts and Manufactures, the Presidents and Vice-Presidents of all lawfully organised County Agricultural Societies, and of all Horticultural Societies, and all subscribers of five shillings annually to the funds of any such Society, in their respective sections of the Province, are by the Act constituted an Agricultural Association for that section. The members of the Board of Agriculture and of the sub-committee of the Board of Arts and Manufactures, and the Presidents and Vice-Presidents of County Societies, and of all Horticultural Societies (or any two members whom a County or Horticultural Society may have appointed Directors instead of its President or Vice-President), are constituted the Directors of such Agricultural Association. These Associations are directed to hold an annual Fair or Exhibition, open to competitors from any part of the Province. Power is given to the municipality of any city, town, village, county or township, to grant money or land in aid of the Agricultural Association for that part of the Province to which the municipality belongs, or of any Agricultural or Horticultural Society whatever duly organised under this Act, or of any incorporated Mechanics' Institute, within the limits of the municipality.

The appendix, annexed to the last quarterly report of the Board for Lower Canada, contains the following paper on the Education of Mechanics, to which they desire to give publicity and wide circulation:—

"The development of the industrial resources of any country should be one of the highest aims of its statesmen and legislators. The duty of governments to foster and promote, if not directly to regulate, the education of the people, is now almost universally recognised among civilised nations. In Canada both these patriotic objects are exciting attention in a greater degree than ever heretofore. It is desirable at present to call public attention to the best means of bringing educational efforts to bear directly upon the development of those resources of the country which fit it to become the seat of important manufactures.

"Abundant water power—inexhaustible mines of iron and other metals and economic materials, almost limitless forests of valuable timber, fertile grain fields from which to feed operatives more cheaply than they can be fed elsewhere; districts densely settled with a population admirably adapted by its docility and ingenuity for factory hands, and (because almost altogether debarred during a long winter from agricultural pursuits), willing to work at a lower rate of wages than the usual standard

upon this continent,—all constitute advantages for the establishment and growth of manufactures which have induced men to plant them here, and must conduce to their successful prosecution. But in a contest waged against the large manufacturing establishments of other countries, long established and supplied with abundant capital, these advantages are not alone sufficient to secure success. It behoves Canadians not only to take steps to secure a more abundant supply of capital, and as soon as possible a larger market, but to make every necessary exertion to enable the classes desirous of embarking in manufacturing pursuits to become acquainted with the best processes now in use, and with all the improvements of process and machinery hereafter made, and to furnish them with opportunities of obtaining an education specially fitting them for manufacturing pursuits.

"It was, doubtless, with such an end in view that the Provincial Parliament at its last Session passed an Act for the establishment of Boards of Arts and Manufactures for both sections of the province. Those Boards have been formed in conformity with the provisions of the statute, but as yet have been necessarily little more than skeletons, unable, for lack of means, to enter upon operations likely to give them extended usefulness.

"Heretofore, Parliament has divided its grants for educational purposes into two classes, viz:—that for rudimentary education in common schools, and that for superior education in grammar schools, colleges, and the universities. Few of those destined to become mechanics or factory hands have enjoyed the benefit of any but the common school education; very many not even of that. As a sort of supplementary educational grant intended for those classes, sums have been annually voted for Mechanics' Institutes. But in very many—if not in the vast majority of those institutions, no attempt has been made to furnish any education specially adapted for the improvement of mechanics in the prosecution of their calling. In a few, evening classes have been established, at which lads have been able to make up for the loss of common school education; reading rooms have been fitted up and stored with political, religious, and literary newspapers, libraries of miscellaneous literature gathered together, and lectures *de omnibus rebus*, delivered; but in only a very few instances have studies been pursued, or educational efforts persistently directed into a course likely to be directly useful to the mechanics' or manufacturers' career. There can be no doubt that even the rudiments of education are useful *per se* to the mechanic as well as to all other men; that hearing lectures and reading books on history or *belles-lettres* will serve to render him a more intelligent man; will stimulate a spirit of inquiry and a love of reading which may perchance be attended with the happiest results. But it is not less certain that the usefulness of the sums granted to those institutions would be very much increased, if steps were taken to furnish mechanics with the means of such an education in science as would specially fit them for their calling, in the same manner as the members of the learned professions of the law, physic, and divinity, are trained at the Universities, and school teachers at the Normal Schools.

"Hitherto science and the mechanic have been kept apart. The University man studies mechanics and the other sciences so necessary for the working man's success in life, but the bounty of Parliament has not enabled the poor apprentice to receive the benefits of such instruction. It is time to remove this anomaly from the educational system of Canada. In England, where education is left so much to voluntary effort, the Society of Arts, with its numerous affiliated institutions,—Mechanics' Institutes and Working Men's Colleges,—is using strenuous and successful exertions to afford instruction in the sciences to the working classes. In Paris, for these many years, the Institution of *Arts et Metiers* has furnished such instruction free to the working classes of the French metropolis. It were a shame to us in this new country

if we did not use like efforts, and, to the extent of our means, like instruments for the attainment of similar ends.

"In Norway, too, and Sweden, provision has been made for the education of the artisan. Brace, in his "Norse-Folk," tells us that attached to the Latin Schools, which prepare students for the University, are, in eleven Norwegian towns, what are called real schools, from which the pupils are sent out to practical life or to the technical and military schools. In these, beside the usual instruction of the best schools, book-keeping, commercial correspondence, the properties of goods, &c., are sometimes among the branches. There are eight "Drawing Schools" in Norway. "To these, of an evening, the mechanics and labourers come together and receive instruction in modelling, drawing, mathematics and natural philosophy." The artisans of several trades are required to take out licenses, which are made dependent on the certificates of these schools. "The effect of the instruction is found to be excellent on the taste of this class in their various trades." Brace speaks of these as conferring a superiority on the Norwegian system of education over the American, to which, in other respects, it is so very much inferior. Of such schools in Sweden, coupled with a like eulogy, he says:—"In a small Swedish town, not larger than Bridgeport, for instance, you find an evening school, where mechanics can learn drawing, modelling, or the practical application of the natural sciences, without any expense. I visited one in Stockholm, which was truly a 'School of Art.' There were in it beautiful plaster models of Greek sculpture, and bas-reliefs of Italian statuary, and of the best Danish bas-relief, than which modern art has nothing more pure and classical, besides plaster casts of heads, fragments of limbs, mathematical blocks, and architectural ornaments from which to draw and model. An original device struck me here of natural forest leaves arranged to draw or mould from. All this with lessons and teachers in the arts, lectures on chemistry and the sciences, is open every evening for labouring men and women. The consequence is, as in France, you have a class in Sweden which America has not, of artisans of taste, artistic mechanics, men and women, who show ingenuity and a tasteful originality in the manufacture of furniture, the decoration, painting and preserving of rooms, the making of common wares and implements. Whatever you are obliged to buy for a house in the shops, without ordering, has not that hard, awkward, angular look, which such articles have with us. Then these schools provide women with a new and beautiful means of livelihood, the arts of designing, painting, drawing, and the applying of science to manufactures. Such schools for labourers exist all through Sweden."

"The population of Norway is about 1½ million, and that of Sweden about 3½ millions. In all the elements of wealth they enjoy no superiority over Canada. Their system of popular education is, as a whole, far behind ours. There is no reason why we should be behind them in this regard.

"It were a disgrace if, after taking the initiative in a scheme of improvement such as this, by the establishment of the Board of Arts and Manufactures, the Government and Parliament of the Province were to turn back from pursuing so good a work, and allow the institutions to linger in a state of inefficiency, or to perish for lack of sufficient pecuniary aid to make them really useful.

"It is hardly possible that any one can fail to see the great need of a scientific education more or less extended to all who seek to prosecute manufactures successfully. Really useful education for the several branches of manufactures must include instruction with respect to the laws of nature, and those properties of bodies which are the subject of scientific generalizations. The manufacturing system of a country should be made gradually to extend to, and to render available for use, all the vast assemblage of substances in nature which constitute its

natural resources, till all are made to add to its developed wealth. Its metals, clays, slates, marbles, granite, flint, and its other useful and precious stones; the bones, skins, tendons, horns, hoofs, and intestines of its animals; the wood, bark, roots, foliage, flowers, fruits, gums, sap, resins, and aromas of its trees and plants, all furnish matters of scientific research and industrial and skilled manipulation. The manufactories and workshops where the labouring classes are employed, are oft-times vast scientific laboratories, where industrial art is applying on a large scale to the production of the conveniences of life and of wealth, the processes discovered or improved by scientific research. Here, too, in the prosecution of his labours, the intelligent handicraftsman is day by day discovering new truths to be added to the domain of science. Heretofore philosophers have been indebted, in a rather larger degree, to the shrewd and patient observers of the workshop for the hints on which they have proceeded to the discovery of scientific truths, than manufacturers to the pains-taking researches of the experimental philosopher for improvements in processes of manufacture. It is time that the savans should repay this debt—and they are endeavouring to do so. It remained for statesmanship to furnish them the proper means and instruments, through which to confer this benefit upon the manufacturing classes and the country. The Boards of Arts and Manufactures, if furnished with means of making their organisation useful in the manner contemplated by their founders, will furnish common ground where the learned man and the practical man or worker can carry on most usefully this interchange of ideas, deriving thence mutual profit—a profit sure to benefit the country. While, on the one hand, the working man would be taught in the schools or colleges founded for him under the auspices of the Boards, the great truths of Mathematical, Physical, and Applied Science, and, it is to be hoped, the important truths of Political Economy bearing on the condition of the labouring man as well;* the man of science would have brought under his notice from day to day, in the Museum and model rooms of the Boards, the various efforts of the inventive faculties of practical men to bring into use improved mechanical appliances, and better processes of manipulation, and would be enabled to note the real progress made, and the blunders committed. While the prime object of the bounty of Parliament should be to promote the education of the industrial classes, this secondary and indirect benefit conferred upon science should neither be disregarded nor looked upon as of trifling importance.

"Doubtless, for a time at least, considerable numbers of the operative class will be unable or unwilling to avail themselves of the opportunities offered them to obtain a scientific education, or at most will only acquire an acquaintance with the merest rudimentary elements. Yet even to these, evening schools will be opened to teach them what they can and care to learn. To the more intelligent among them, and the class immediately above them, an education could and should be afforded which should be in a genuine sense scientific, and at the same time decidedly practical. That there should be a well-educated, well-informed class of men to act as foremen and superintendents of all large establishments, is almost a *sine qua non* of manufacturing success. Having to contend with the larger capital and more firmly established factories of other countries, we cannot hope to compete

What could be more important in promoting contentment and tranquility among the masses than presenting to them the golden truths comprised in a comprehensive view of the philosophy of industry, teaching them the dignity of labour; the enjoyment springing from purity of life, from well-arranged domestic economy and sanitary regulations; explaining all that relates to the enjoyment of capital, and the fair remuneration of labour; together with just views of the aims and uses of public education,—laying before them in familiar terms those practically valuable parts of political economy bearing on their local and class interests.

with them satisfactorily, if, because of our tardiness in this respect, their workmen are also much better educated, better fitted, better trained for their work. The knowledge of the best processes of manufacture, the best machinery, and the best mode of its application tends to an immense reduction of expense. Ignorance breeds waste of time, labour, and capital, which must prove fatal to success. Take but one department of skilled labour, the care of steam engines, and how frightfully long is the catalogue of known losses of life and of property resulting from the unhappy ignorance of those who have had engines confided to their charge.

"The education of the labouring man for the proper exercise of his craft is second in importance to no question of political economy or practical philanthropy which engages the attention of statesmen. And it is much to be desired that Parliament will see fit to substitute for or add to the numerous grants usually made in aid of Mechanics' Institutes, (some of which are frittered away to serve the purposes of others than the class intended to be benefitted, and others used in a manner not calculated especially to promote the education of the artisan for his business,) a large grant to the Boards of Arts and Manufactures to enable them to promote such education. Properly furnished with means and appliances for their work, they can and are prepared to perform the labour which is necessary to secure the great objects contemplated in their formation. Without those means and appliances they are powerless for good."

ATLANTIC TELEGRAPH.

The instruments on both sides of the water are now at work, and messages pass at the rate of about a word and a-half per minute.

TRADE MARKS.

A meeting of the Birmingham Chamber of Commerce was held a short time since, Mr. GEORGE DOWNING in the chair. The question as to the improper use of trade marks, which has been recently brought before the public in connexion with the Collins Company, U.S., against certain manufacturers in Birmingham, Sheffield, and Wolverhampton, was discussed at some length.

Mr. J. D. GOODMAN (Joshua Scholefield and Sons), in introducing the subject, said he was not sanguine that much good could be done by the chamber; but they should not be doing their duty by the commercial public if they flinched from considering it at a time when it had been brought so prominently before them. He was most anxious that no reference should be made to the individual cases that had recently been made public; they were not there as a court to sit in judgment, or to express opinions, or hear explanations, with respect to those cases; it was only the general ground upon which they could venture to touch upon that occasion. He thought, however, that they ought unmistakably to express their opinion that such a practice as the improper use of trade marks was wrong, and would be discouraged in every possible way by that chamber. With this view he had prepared the following proposition for their approval:—"That this chamber is anxious, in every way in its power, to discourage the improper use of trade marks, and refers the subject to the council, with a request that it may receive immediate consideration, with a view to such steps being taken as may be deemed advisable." As he had said, he did not anticipate much practical good would result, as the chamber had but little power of throwing a shield over any attempts it

might make to check the practice. Still the discussion of the question, and the publicity which might be given to it, might tend to effect their object in a great degree. The first question that arose was, "What was an improper mark?" There was no difficulty in seeing that it consisted in the use of the name of any other manufacturer residing in England or abroad; and further, all colourable imitations of such marks ought to be emphatically discountenanced. Then there was a class of marks, with regard to which there existed a misunderstanding. He referred to the names of manufacturers or firms no longer carrying on business. He believed it was a common practice to use the names of such parties, but it was quite true that in some instances the persons using them might have a property in them. Then, again, there was a great number of marks amongst which there was one kind that the chairman had spoken of. He referred to the common practice of stamping on goods the marks of the tradesmen who sold them, and not the manufacturer by whom they were made. This was a practice that ought to be deprecated in the strongest manner; but he did not see that it could be checked by any legislative enactment, nor did he think it was desirable such an attempt should be made to stop it, but were it put an end to it would redound greatly to the credit of the town, and he, for one, should be exceedingly glad to see everything that emanated from our local manufactories stamped with the word "Birmingham." At present he feared the best manufacturers in London, Sheffield, New York, and other places, were enjoying the advantage of placing their marks upon first-class goods made in this town, whilst the credit of the rubbish was left to us, though there was a good deal of credit attaching to even that. There were modifications in the use of a maker's name that were absolutely necessary. Many manufacturers stamp their name upon their best goods, their initials on the second quality, and their place of business on others. These were unobjectionable; but when they came to the use of fictitious names, which were commonly used in this town, although he deprecated the practice as not being strictly proper, it had, nevertheless, its uses. But returning to the improper use of trade marks, about which there could be no question, how could it be checked? This gave rise to another question, "Who is responsible?" As a merchant, he did not wish to flinch from a degree of responsibility in giving an order. But whilst he would hold the merchant responsible for his share he could not absolve the manufacturer from bearing his share. He was disposed almost to think that the greater share of responsibility devolved upon the manufacturers, and he would give them his reason. The merchant dealt in a vast number of articles, and he could not be supposed to have such an individual knowledge of each article as the manufacturer who made them, and therefore the latter might be presumed to be the best acquainted with the names on articles in his branch of trade, and when a manufacturer received an order to be stamped with a name which he considered doubtful, he ought to consult the merchant as to whether he had authority for using such names. The merchant when thus placed on his guard would act according to his discretion, and the responsibility would rest with him. Now, a short time ago, he heard of a merchant receiving an order for steel pens, to be marked with the name of a certain French pen manufacturer. He (Mr. Goodman) did not know the name of a single French pen manufacturer; but he thought the English manufacturer would naturally have a knowledge of such matters, and be able to inform the merchant with respect to them. On this ground it was he thought a greater share of responsibility ought to rest upon the manufacturer. If, however, both the merchant and manufacturer would do all in their power to put down the abuse of the trade marks, they should succeed at home, and by-and-by they should check the practice in other countries. No doubt at present English manu-

facturers were injured by the present system, and he was satisfied they had only to establish a principle in order to check it. Having observed that the Collins Company had sought and obtained legal redress in this country, and having expressed a fear that such would not be the case with an English manufacturer who might appeal to the American courts of law, Mr. Goodman remarked that he was not prepared to suggest any course that it was advisable to pursue in this matter, but he threw out the remark he had done in the hope that the chamber would be induced to assist both merchants and manufacturers in checking so injurious a system. There were many cases, in all probability, where manufacturers were using names with regard to which the chamber might entertain some doubt, and in such instances the chamber might call on them to explain the grounds on which they thought it right to use those marks, and if the chamber expressed its opinion that the marks were improper, the use of them would doubtless be discontinued.

Mr. C. REEVES seconded the proposition. He said he acquiesced in all that had been said relative to the use of illegitimate marks, and too strong language could not be used in condemnation of the practice when knowingly carried on. He did not think the checking of such practices was surmounted by such difficulty as Mr. Goodman appeared to imagine, and he considered that a legislative enactment, which should lay the responsibility on each individual concerned, would operate beneficially. He disagreed with Mr. Goodman's opinion, however, as to the amount of responsibility to be placed upon the manufacturer as compared with the merchant. How could a manufacturer, who never, perhaps, received a foreign letter, be so likely to be aware of the names of persons in business abroad as the merchant who was continually in the receipt of foreign correspondence? One great difficulty that seemed to him to be involved in the checking of the improper use of trade marks, was the objection entertained by the merchant to allow the name of the manufacturer to appear on goods exported to foreign countries. However excellent in material and workmanship goods might be, and whatever reputation a manufacturer might have, the last thing a merchant would do would be to allow him to place his name upon them if they were for exportation. He contended that the manufacturer ought to have the power of taking out a trade mark, leaving it to the merchant to accept the goods or not, as he might choose, and this would do away with the objection to the use of the manufacturer's name, whilst it would afford the manufacturers that protection to which they were entitled. He hoped ere long to see something of this kind carried into effect by law, as at present there was scarcely safety to any manufacturer using marks in cases where buyers required their names stamped on them.

Mr. J. S. WRIGHT took a similar view of the case to Mr. Reeves, and considered the merchant ought to be made responsible in a greater degree for the use of foreign trade marks than the manufacturer, who, in many cases, might be a person that could not write his own name. He regretted that this question should have been brought under their notice in the manner it had by a recent event; but he believed much good would result from the discussion of it. With regard to this town, he thought it had suffered probably more than any other in not affixing "Birmingham" to all the goods manufactured here. There was another branch of the question in which, he thought, they ought to take action, and that was with reference to foreign made goods coming into this country bearing English names.

Mr. REEVES said that an enactment introduced some years ago into parliament by Mr. Hawkes, M.P. for Dudley, and which was still in force, would meet the class of cases referred to by Mr. Wright.

Mr. GODDARD said Mr. Goodman was in error in supposing that an English manufacturer would not obtain

redress in the American law courts for an infringement of his name.

After a few words from Mr. MANTON in support of the proposition, in the course of which he said he knew many names were wrongfully made use of,

Mr. GOODMAN said he never intended to convey the impression that he thought the merchants ought not to bear their fair share of responsibility.

The CHAIRMAN, before putting the resolution to the meeting, suggested, as worthy of consideration, whether some marks analogous to the brands used in the iron trade, might not be used with advantage.

The motion was then put and carried unanimously, and the meeting was dissolved.

TUNNEL THROUGH THE ALPS.

A communication on this subject has recently been made to the French Academy of Sciences by M. Menabrea, and published in the *Comptes Rendus*, states that several months ago the immense work of boring a tunnel under the Alps, between Modane and Bardonnèche, was commenced. These places are situated on opposite sides of the Alpine chain which divides Piedmont from France, at a point where the valleys of the Arc and the Doire are almost parallel to each other, and here they are on the same level, the mountain being most narrow at this spot. This important position had been noticed about twenty years ago by M. Medoil, and had often attracted the attention of engineers and geologists. The tunnel will be 12½ kilometres in length, and is designed in the same vertical plane, but, to facilitate drainage, is somewhat higher in the middle than at the extremities, so as to form a slope on each side, one being an inclination of five in a thousand, and the other being twenty-three in a thousand, in consequence of a difference of level between the two extremities, the heights being—Bardonnèche (southern orifice), 1,324 metres; highest point, 1,335 metres; Modane (northern orifice), 1,190 metres above the level of the sea. The crest of the mountain being 1,600 metres higher than the highest point of the tunnel, the sinking of shafts was practically impossible; hence the tunnel could only be worked at its extremities, so that it was calculated that the labour by the ordinary processes could not be completed in less than 36 years. The difficulty of ventilation was also very great. The mountain having been examined geologically by MM. Elie de Beaumont and Angelo Sismonda, was found to contain micaceous sandstone, micaceous schists, quartzite, gypsum, and limestone; of these various kinds of rock, the quartzite alone would be likely to offer any serious resistance to engineering operations, but the stratum of this appeared not likely to be very thick. The plan proposed for overcoming the difficulties was put forward by three Sardinian engineers, MM. Sommeiller, Grattone, and Grandis, who proposed to turn the abundance of water, for which the locality was remarkable, to account by applying it to a peculiar system of perforation and ventilation. The first apparatus designed by these gentlemen consists in an hydraulic air-condenser, which is a syphon turned with its orifices upwards, and communicating by one of them with a stream of water, and by the other with a reservoir of air. The water, descending into the first branch, enters the second, and by the pressure it exercises condenses the air, which is then forced into the reservoir. When the compression of the air arrives at a certain point, a valve is opened, by which the water contained in the syphon is let out, and the operation re-commences. The emission and introduction valves are regulated by a small machine operating by means of a column of water; and the air in the reservoir is maintained at a constant degree of pressure by a column of water communicating with another reservoir above. This condensed air is used

both as a motive power, and for ventilation. Commissioners were appointed by the Sardinian Government, of which the author of this paper was one, to investigate the efficacy of this plan. Their experiments were made with two kinds of perforators, worked by condensed air instead of steam, one invented by Mr. Bartlett, the other by M. Sommeiller; it is stated that by means of these, holes for blasting may be bored through the hardest sienite in one-twelfth of the time which would be required if ordinary means were employed. The perforators have also another advantage; in a space where three couples of miners could hardly be placed, 18 perforators may be set to work; so that, by these contrivances, it is said that the perforation of the tunnel may be effected in six years instead of 36, as the inventors calculate upon advancing three metres per day on each side of the mountain, or six metres per day in all. It is calculated that it will require 85,924 cubic metres of air per 24 hours to replace that which has been vitiated by respiration, torches, and gunpowder at each end of the tunnel, which is equivalent to 14,320 cubic metres of air condensed to six atmospheres. As the quantity of air necessary to put in action the perforating machines will be only 667 cubic metres at the pressure of six atmospheres, a large portion of the compressed air will thus be available for ventilation. Both on the side of Bardonnèche, and on that of Modane, it is said that water power exists which is abundantly sufficient for the required purpose. Whenever this great work is finished, it is calculated that the journey from Paris to Turin will only occupy 22 hours, and from Paris to Milan only 27 hours. The author is of opinion that great credit is due to the Sardinian Government for the liberal and judicious manner in which it has encouraged this great and important work.

PAPER DUTY.

The Commissioners of Inland Revenue in their last report in reference to this subject state as follows:—

“The quantity charged with duty in the year ended 31st March 1857, 192,297,399 lbs.; in the year ended 31st March 1858, 187,414,667 lbs.

If the objections so constantly urged against the paper duty were such as we are accustomed to hear most insisted upon in the case of Excise duties generally, namely, their restricted and oppressive incidence on the manufacturer, the advocates of the abolition of the tax would find it difficult to make out their case. There is scarcely any duty in the collection of which our interference is so little felt, and in which we are so continually adapting our regulations to the wants or wishes of the trade.

An instance which has occurred this year is a fair sample of the difficulties which we have to meet, and of the disposition with which we encounter them; we allude to the drawback granted to envelope makers on their waste cuttings.

The trade of envelope making has been rapidly increasing since the introduction of the penny postage system, and has become a very considerable branch of national industry. At first it was carried on by stationers only, the papermaker being precluded by the Excise laws from engaging in it. But so long ago as in the year 1850, we were induced by the representations of the papermakers to remove the restriction, unnecessary as it was found to be for the security of the revenue, and undoubtedly interfering to a very serious degree with the natural and most economical course of manufacture. The effect, however, of this change in our regulations was something more than a mere removal of a prohibition from the papermaker to conduct his business to the greatest advantage; it gave him the means of avoiding

the payment of duty upon a considerable quantity of paper which never went into consumption, and which, therefore, according to ordinary rule, would if practicable, be fairly entitled to exemption or drawback. This was the waste produced in cutting the envelopes from the rectangular sheets of paper.

So long as the papermaker was prohibited from cutting envelopes, the duty, being charged upon the paper before it left his mill, attached to that portion which afterwards was cut away by the stationer in small angular strips—useless for any of the ordinary applications of paper; but the envelopes now allowed to be made at the paper mill are charged after being cut from the sheet, and the waste is again made into pulp and reproduced as paper.

The concession was thus of very great importance to the papermaker, and gave him the advantage over the stationer in the manufacture of envelopes, which must have been extremely valuable. It is indeed surprising that the stationers, some of whom carry on this business to an enormous extent, should not have succeeded before last year in impressing us with a sense of the injury inflicted upon them by the regulation which we had made in favour of their competitors in trade; but their case, when fully developed, was so strong, that we could not avoid making some attempt to give them relief, notwithstanding numerous practical difficulties which we foresaw. These however have been overcome, and under your Lordship's authority we are now enabled to give to stationers a drawback of the duty on the waste cuttings produced in making envelopes, on condition that such cuttings shall be reduced to pulp under the superintendence of an officer at a paper mill.

To place these two descriptions of traders on an equal footing may indeed seem too simple a matter to deserve the notice which we have taken of it. But your Lordships are aware that this concession involved great practical difficulties and some danger to the Revenue,—more, indeed, than we should have been justified in incurring for the sake of any less urgent claims or less important and increasing trade.

Few persons have an adequate conception of the magnitude of that trade, and few are aware that the superiority of the British over the German, French, and American manufacture has obtained for our exporters a steadily increasing business in the markets of the United States and Canada, of India, Australia, and all the British Colonies. We are entitled to regard this as some evidence that our fiscal regulations do not press unduly upon the manufacture of paper.

CONSUMPTION OF SMOKE.

Some short time since, the owners of steam-tugs plying upon the Tyne, to the number of 150, received notice from the Inspector of Nuisances of Newcastle-on-Tyne, under pain of being proceeded against for penalties under a local Act, to consume the smoke emitted by their boats, which at all times, but more especially on the occasion of busy sea tides, when from 100 to 200 vessels have to be towed out at a tide, issued from the funnels of the steam-tugs in thick volumes of the blackest density. The tug owners thereupon consulted Mr. Armstrong, of Elswick, the engineer, and, under his advice, enlisted the services of Dr. Richardson and Mr. Reed, of Newcastle, under whose superintendence experiments have for some time past been carried on, at Elswick, near Newcastle, to prove the practicability of consuming the smoke produced by the coal raised from the great coal-fields of Northumberland and Durham. It was arranged that one of the steam-tugs should be placed at the disposal of Dr. Richardson and Mr. Reed, for the purpose of making such alterations in the furnaces as they considered would effect the desired object, and in order that, in case of success, the other steam-tugs might be altered in a like

manner. The *Expert* steam-tug, belonging to Mr. William Melbourn, of North Shields, was offered for the purpose, and a series of experiments were made upon the furnaces, the plan adopted being very simple, consisting of a proper admission of air into the furnace, which, combined with careful stoking, was expected to consume the smoke. After certain alterations were effected, the tug was taken to sea, with a party of steam-tug owners, and their solicitor, Mr. Kewney, and the Inspector of Nuisances on board, and it was found that the improvement effected was very great, upwards of 75 per cent. of the smoke being consumed, and the remainder being of a character far less offensive, being thin and light-coloured. The inspector considered that the result was very satisfactory. Dr. Richardson and Mr. Reed were determined, however, to effect a perfect consumption of smoke, and made further alterations. On Thursday, the 5th instant, the *Expert* proceeded to sea, on a voyage from Newcastle to Warkworth, a distance of 30 miles, having on board Mr. Miller and Mr. Taplin, Government engineers, sent from Woolwich and Portsmouth, to test the experiments going on at Elswick to consume the smoke, with a view to re-introduce the Northern coal into the naval yards; and also having on board Dr. Richardson and Mr. Reed, and a party of steam-boat owners and their solicitor. It was found that the alterations, which were of a simple character and comparatively inexpensive, entirely effected the consumption of the smoke, there being none whatever visible throughout the voyage out or home, except when Mr. Reed, in order to exemplify the truth of the system, stopped the admission of the air, and allowed the smoke to be produced, showing at pleasure either smoke or not, as he thought fit. The other steam-tugs in the association, and the steam-ferries on the Tyne, will be fitted-up with the apparatus forthwith, and it is anticipated that a great nuisance to the river and harbour towns of the Tyne, occasioned every sea-tide by a black fall of smoke hanging over them, and sometimes entirely obscuring the view of the sea, will be entirely removed.

PATENT LAW AMENDMENT ACT, 1852.

The following is the report of the Commissioners of Patents for the year 1857, in continuance of their report of proceedings for 1856.

"The number of applications for provisional protection recorded within the year 1857, was 3,200; the number of patents passed thereon was 2,028; the number of specifications filed in pursuance thereof was 1,976; the number of applications lapsed or forfeited, the applicants having neglected to proceed for their patents within the six months of provisional protection, was 1,172.

The number of applications recorded within the first six months of the current year (1858) was 1,474; therefore, estimating the total number for the year at about 3,000, a decrease of about 200 on the whole year, as compared to the number of the year 1857, may be expected.

The Act 16 Vict. c. 5, enacts that all letters patent for inventions to be granted under the provisions of the Patent Law Amendment Act, 1852, shall be made subject to the condition that the same shall be void at the expiration of three years and seven years respectively from the date thereof, unless there be paid, before the expiration of the said three years and seven years respectively, the stamp duties in the schedule thereunto annexed, viz., £50 at the expiration of the third year, and £100 at the expiration of the seventh year.

One thousand nine hundred and thirty-one patents bear date between the 1st July 1854, and the 30th June 1855; the additional stamp duty of £50 has been paid on

602 of that number; and 1,429 have become void by reason of nonpayment.

All the provisional, complete, and final specifications, filed in the office upon the patents granted under the Act, have been printed and published in continuation, with lithographic outline copies of the drawings accompanying the same, and within three weeks of the respective dates of filing, according to the provisions of the Act 16 and 17 Vict. c. 115.

The provisional specifications filed in the office lapsed and forfeited, have also been printed and published in continuation.

Printed certified copies of the specifications filed in the office, as also certified copies of patents, and of the Record Book of assignments of patents and licences, with copies of such assignments and licences, have been sent, in continuation, to the office of the Director of Chancery in Edinburgh, and the Enrolment Office of the Court of Chancery in Dublin, pursuant to the Act of 1852 and the Act of 16 & 17 Vict. c. 115.

The work of printing the specifications of patents enrolled in Chancery previous to the Patent Law Amendment Act (1852), 12,977 in number, the first dating October 1711, was commenced in September 1853. This work has been completed.

In a schedule to the report is given the following account of Stamp Duties, paid upon passing Patents for Inventions under the Act to substitute Stamp Duties for Fees (16 Vict. c. 5,) for the year 1857:—

3,200 petitions for grant of letters patent at £5 each	£16,000	0	0
2,294 notices of intention to proceed with application, at £5 each	11,470	0	0
55 notices of objection to the grant of letters patent, at £2 each	110	0	0
2,081 warrants for patents, at £5 each ...	10,155	0	0
2,028 patents sealed, at £5 each	10,140	0	0
1,976 specifications filed at £5 each	9,880	0	0
716 entries of assignments of patents and licences, at 5s. each	179	0	0
450 searches and inspections at 1s. each ..	22	10	0
16,692 folios of office copies of documents, at 2d. per folio of ninety words ..	139	2	0
510 patents upon which the progressive stamp duty of £50 has been paid ...	25,500	0	0
1 patent on which the progressive stamp duty of £100 has been paid...	100	0	0
10 patents granted under 53rd section of the Act, on which the progressive stamp duty of £16 13s. 4d. has been paid	166	13	4
5 duplicate patents issued in lieu of original patents lost or destroyed, £5 each	25	0	0
	£83,887	5	4

To the report is annexed the balance-sheet of income and expenditure for the year 1857, as follows:—

RECEIPTS.			
In stamp duties in lieu of fees	£83,887	5	4
By sale of prints of specifications, indexes, &c.	1,463	16	11
Surplus income on balance of accounts, from the 1st October, 1852, to the end of the year 1856	13,678	11	6
	£99,029	13	9

PAYMENTS.

Fees to the law officers of England	£	8,913	9	0
Their clerks		798	10	0
Salaries of officers and clerks in the Commissioners' office		4,546	0	0
Compensations		4,584	0	0
Current and incidental expenses in the Commissioners' office		7,565	11	8
Cost of stationery supplied by Her Majesty's Stationery-office, books for the free Library established in the Patent-office, and binding		843	13	8
Rent of offices and library		490	0	0
Messrs. Eyre and Spottiswoode, for printing specifications of patents, indexes, &c., and		38,506	3	2
Lithographers' bills for drawings accompanying specifications				
Cost of paper supplied to printer and lithographer by Her Majesty's Stationery-office		9,161	0	6
Expenses incurred in respect of the Museum at South Kensington		1,966	0	8
Clerks' salaries for ditto		375	0	0
*Revenue stamp duty account as below		15,275	0	0
Surplus Income		6,005	5	6
		£99,029	13	9

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The twenty-eighth meeting of the British Association for the Advancement of Science will commence in Leeds on Wednesday, the 22nd of September, 1858, under the presidency of Richard Owen, Esq., M.D., D.C.L., V.P.R.S., &c.

The General Committee will meet on Wednesday, the 22nd of September, at one p.m., for the election of sectional officers, and the despatch of business usually brought before that body. On this occasion there will be presented the Report of the Council, embodying their proceedings during the past year. The general committee will meet afterwards by adjournment.

The First General Meeting will be held on Wednesday, the 22nd of September, at 8 p.m., when the President will deliver an Address; the Concluding Meeting on Wednesday, the 29th of September, at 3 p.m., when the Association will be adjourned to its next place of meeting.

At the Evening Meetings, which will take place at 8 p.m., discourses on certain branches of science will be

* The Act of 1852, in lieu of the old duties upon patents, imposed a revenue stamp duty of £5 upon the warrant of the law officer, £10 upon the certificate of payment of the progressive fee of £40 at the expiration of the third year, and £20 upon the certificate of payment of the fee of £80 at the expiration of the seventh year of the patent.

The Act of 1853 (16 Vict. c. 5), converted all the fees imposed by the Act of 1852 into stamp duties.

The Revenue stamp duty account for the year 1857 is as follows:—

2,031 warrants of the law officers for patents at £5 each	£10,155	0	0
510 patents on which the progressive duty of £50 has been paid at the end of the third year from their respective dates, (£10 being Revenue stamp duty, and £40 fee stamp duty); 510 at £10 each	5,100	0	0
1 Patent on which the progressive duty of £100 has been paid, £20 Revenue stamp duty, and £80 fee stamp duty	20	0	0
	£15,275	0	0

delivered, and opportunity will be afforded for general conversation among the members.

The Committees of Sections will meet daily, from Thursday, the 23rd, to Wednesday, the 29th of September, inclusive, at 10 a.m. precisely.

The Sections will meet daily, from Thursday, the 23rd, to Tuesday, the 28th of September, inclusive, at 11 a.m. precisely.

Notices of communications intended to be read to the Association, accompanied by a statement whether the Author will be present or not at the meeting, may be addressed to John Phillips, Esq., M.A., LL.D., F.R.S., Assistant General Secretary, Magdalen Bridge, Oxford; or to the Rev. T. Hincks, W. Sykes Ward, Esq., and Thomas Wilson, Esq., Local Secretaries, Leeds.

SOUTH KENSINGTON MUSEUM.

During the week ending 14th Aug., 1858, the visitors have been as follows:—On Monday, Tuesday, and Saturday (free days), 2,590; on Monday and Tuesday (free evenings), 4,028; On the three Students' days (admission to the public 6d.), 583; one Students' evening, Wednesday, 88. Total, 7,289.

Home Correspondence.

THE SOCIETY OF ARTS EXAMINATIONS.

SIR,—In my last letter I alluded more particularly to the mode of making Local Examinations more directly serviceable to the object in view by establishing, if possible, systematic action upon a uniform principle. I would now, however, direct the attention, not only of the Council, but also of the local authorities, to the advantage and propriety of extending the system of Examination as far as possible to the pupils of elementary classes. There is no doubt that the principal design of Mechanics' Institutions was to extend the cultivation of science and literature to those portions of the community who, from the nature of their avocations, had no other opportunity of mental improvement, but it is equally true that, from the defects of early education, which may be owing, perhaps, to early employment and parental neglect and indifference, the instruction imparted in a great many Institutions is altogether of an elementary character, whilst in many Institutions where class instruction is extensively carried on, that of an elementary character greatly preponderates. We have, therefore, to deal with a state of things which exists, if not exactly as we would have it; and the prudent course would be to render it available to the greatest extent for the promotion of that self-culture which is the distinguishing characteristic of the people of this country.

In an examination of elementary acquirements, there is, of course not required that skill in the examiners which is indispensable for the subjects comprised in the programme of the Society of Arts. Indeed, all that is requisite might be accomplished by local means, but material weight would be given to such examinations if conducted under the auspices of the Society, and certificates of a lower grade granted for proficiency. The hope of gaining a certificate would operate as a stimulus to improvement, whilst prizes, which need only be of small value, would, in many cases, be provided by those in the neighbourhood who take an interest in the welfare of the Institution, and who would have less objection to give pecuniary aid where its good effects are visible, than is too often the case at the present time, when so few comparatively seem desirous to take advantage of the opportunities afforded them. It might also be worth the consideration of Local Institutions if an incentive to elementary improvement might not be created by making

membership free of payment an additional reward to the holders of first-class certificates.

All who have paid any attention to the subject must admit that no system which has yet been devised for the promotion of the instruction of the population in useful knowledge has proved so successful as that of Examination. It is, indeed, in exact accordance with the feelings which most commonly animate human nature. Those who have mastered the drudgery of learning, and bettered their position in society, can readily appreciate the benefits of mental cultivation, but the great majority of our youth, whose subsistence depends upon their industry, whose labours of the week supply the wants of the week, are not so well able to realise to themselves the future good which they may acquire. They need some aid to lend strength to their resolves and invigorate their exertions; and, besides this, they cannot avoid the feeling that, whatever may be the amount of knowledge they may accumulate, it will prove of little value to them beyond the mere possession of it, because the humility of their position in life forbids them the opportunity of making their acquirements known to those who could render them of any value.

It is for this latter reason more especially that public examinations prove so important an aid to voluntary exertions for self-improvement, particularly with reference to the members of Mechanics' Institutions; and as those who possess the least knowledge have the least desire for the acquisition of more, the application of the stimulus to elementary instruction becomes obviously the more necessary. It may also be viewed as a preparation of students for the Examinations of a higher class, and, by rendering our young men familiar with the practice of emulation, prove of threefold benefit.

To effect this object, it will not be necessary for the Society of Arts to do more than lend its countenance to devise a uniform plan of action which shall be applicable to all Mechanics' Institutions in Union with the Society, and to grant such certificates as may be awarded by the Local Boards of Examiners appointed under their sanction. Such an addition to the labours of the Local Examiners would help to give permanence to their existence as a Board, and promote, in a great measure, that co-operation with Institutions which is so highly desirable. I would suggest that elementary examinations should be held a short time previously to the preliminary examinations for the higher branches of study, and that none but those who have shown proficiency in the first should be allowed to take part in the second. This would help to lessen the time occupied in the ordinary preliminary examinations, because the attainments of the candidates in the elementary branches of education would have been previously ascertained.

In order, however, that any benefit should arise from such incentives to education, it is indispensable that the committees of Mechanics' Institutions should use active exertions to promote the improvement of their own members. It will be a fatal mistake to rely upon the Society of Arts, or even a Local Board of Examiners, or, indeed, on any other body than themselves, if they desire to see their Institutions flourish. It is wisdom to lend aid where aid may be of service, but it is folly to allow such aid to supersede our own exertions. The great value of an Institution is in the labour devoted to the instruction of its classes within its own walls, and the value of the Examinations is in the additional stimulus which they afford to the exertions of the members, and the opportunity which they give for testing the extent of the improvement. Knowledge is but the means to an end; the certificate gained by examination is but an evidence of its acquisition, but the more substantial reward will be sure to follow, as it has followed in so many striking instances, and these facts should be steadily kept in view, both by teachers and pupils, as well as by the committees of Institutions.—I am, &c.,

Leeds.

FARNETT BLAKE;

Proceedings of Institutions.

ASHFORD.—The last report of the South Eastern Railway Mechanics' Institute states that the number of members has increased from 104 to 134. A series of monthly entertainments have been given during the winter months, consisting of lectures, essays, and readings from celebrated authors, varied with performances by the glee class. These have been remarkably successful, having been so well attended that on two occasions the room could not accommodate the number of persons desiring admission. The lectures in connection with the Institute have also been attended by a greater number of members than during any preceding season. The funds of the Institution have been augmented by a donation of £5 from the Directors of the South Eastern Railway Company, in addition to the members' subscriptions and the proceeds of the entertainments. The glee class still continues to hold its meetings weekly for the practice of glees, and a drawing class has been successfully carried on. Several additions have been made to the library.

LOUGHBOROUGH.—The tenth annual report of the Literary and Philosophical Society for the past year shows that it has fully maintained its position and character, both as to the interest and instructiveness of its lectures and papers and the number and attendance of its members. The committee state that it had sometimes, in years past, been a subject of regret that so few of the actual members of the society gave it the benefit of their labours in different branches of learning and science; and it was therefore with great satisfaction that they are able to state that out of thirteen gentlemen whose lectures and papers have been given during the past year, eight were members of their society. The society now consists of 162 members, 19 new members having joined, and 15 having ceased to belong to it. During the past year the following lectures and papers have been given:—Mr. J. E. Carpenter, of London, "The Road, the River, and the Rail;" Rev. T. White, M.A., "The Influence of Christianity on the Law of Nations;" Mr. Spanton, "Our Connection with the Society of Arts;" Rev. T. A. Smith, M.A., "The Study of Insects;" C. W. Wood, Esq., of Woodhouse, "The Houses we Live in," illustrated by experiments (chiefly in relation to the human body); Rev. W. Jarrold, of Kegworth, "China: its Geography, Religion, Literature, Manners, and Customs;" Prof. H. Christman, M.A., of London, "The Domestic Habits of our Ancestors;" H. Vincent, Esq., of London, "The Progressive Tendencies of Society in Great Britain;" H. Vincent, Esq., "Our Young Men and Women; their Present Position and Future Prospects;" J. F. Hollings, Esq., of Leicester, "Russia under Catherine II.;" J. F. Hollings, Esq., Ditto, continued; Dr. Edgewood, "On Man, contrasted with the Lower Animals;" Rev. T. Drake, M.A., of Barrow, "The Mosaic Account of Creation as distinguished from Geology;" Rev. J. F. Bateman, M.A., of Sutton Bonington, "Notes of a Visit to Canada and the Atlantic Cities of the Union;" Rev. H. G. Tomkins, B.A., of Kegworth, "Life of Alfred the Great;" Mr. H. Hughes, "The Iron Manufactures of South Wales and Staffordshire."

NEWPORT.—The seventeenth annual report of the Athenæum and Mechanics' Institute, states that although the advance has not been so marked as in the preceding year, the Committee still think that there is reason to congratulate the members upon the present state of the Institution. The past year has been one of great commercial depression, from which the district has suffered to a very large extent. The number of members, however, has not diminished, but shows a slight increase. The Committee, having last year received notice from the Town Council to vacate the rooms so long held by them in the Town-hall, have made arrangements with the

Diocesan Board of Education to take their school premises in Dock-street, for the purposes of the Athenæum, with the option of purchasing the same at the end of a year for £150. This they regard as a favourable arrangement. The building, with a small outlay, will afford a reading-room quite large enough for the purposes required, with commodious library and committee-room; and should the Athenæum increase to that extent which may be reasonably expected, there is a piece of ground large enough to erect a building, with a hall larger than any in the town. At the general meeting, held on the 27th April, 1857, the committee were recommended to appoint a paid secretary. They appointed the present secretary, Mr. Matthew Johns, and are pleased to state that they are fully satisfied with the manner in which he has performed his duties, and have re-appointed him for the ensuing year. The Committee regret that during the past year there have been no classes in existence in connection with the Institution. This they regard as a great loss to the members, and hope that in future they may be able to secure the services of a sub-committee, whose special duty shall be to look after this department of the Society's usefulness. They specially invite the attention of the members to the Examinations instituted by the Society of Arts, and while they regret that as yet there has been no offer of members to undergo such examination, they trust, for the credit of the Institution and the honour of the town, that another year will find some members ready to present themselves as candidates for examination. The average number of members for the past year has been 472 per quarter, being an increase of 16 members per quarter over the average of the preceding year. The library now contains 2,535 volumes. The committee have expended from the funds of the Institution £21 10s. 6d. in the purchase of books, and also the sum of £5, kindly placed at their disposal for that purpose by Sir Charles Morgan, Bart. Numerous donations have also been received. The number of volumes circulated during the past year has been 10,437. The catalogue has been completed, and great praise is due to the librarians for the very creditable manner in which they performed their task. The printing cost the Institution £12. The following lectures and entertainments have been given during the year:—Miss Julia St. George, "Home and Foreign Lyrics;" Sir Thomas Phillips, F.G.S., "British Rule in India;" Mr. J. T. Topham, "An Evening with Shakespeare;" Mr. J. W. R. Dickens, "Social Life in England;" Mr. F. R. Young, "Single Life;" Mr. J. E. Carpenter and the Misses Mascall, "The Road, the River, and the Rail. An Hour in Fairy Land;" Mr. J. K. Applebee, "Life's Poetry," and "Oliver Goldsmith;" Mr. Walter Rowton, "An Evening with our Comic Authors," and "Illustrations of Ancient Minstrelsy;" Rev. W. S. M. Aitchison, "Tennyson and his Poetry;" Mr. Ellis Roberts, Miss Annie Cox, and Miss B. M. Waugh, "Notes of a Wandering Minstrel;" Henry Owgan, Esq., LL.D., "The Four Literary Eras;" Mr. Augustus Fairbairn and the Misses Bennett, "A Night w' Burns;" Mr. C. F. Partington, "India" (two lectures); Miss Clara Seyton, "The Omnibus." The Committee have paid in fees to lecturers, and expenses connected therewith, the sum of £103 2s., the receipts having only amounted to £77 19s., thus causing a serious loss to the funds of the Institution. The average attendance was 145, which, compared with that of last year, shows a deficiency of 43 per lecture. The committee, in closing their report, desire especially to express their recognition of the services rendered to the institution by the honorary secretary, Mr. John Wood, whose persevering efforts on its behalf entitle him to the gratitude of the members. A testimonial, consisting of a valuable microscope, subscribed for by members of the Institution, was presented to him at the last annual meeting.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, Aug. 13, 1858.]

Dated 13th April, 1858.

794. G. A. H. Dean, 11, Ludgate-hill—An imp. in stereo-scope's slides.

Dated 14th July, 1858.

1590. J. Rheinauer, Offenburg, Baden—Imp. in the bearings for axles and shafts, in order to lubricate and exclude dust from such bearings. (A com.)

Dated 26th July, 1858.

1683. E. Jones, Olive-house, 20, Camden-cottages, Camden-town—Effecting a better system of drainage, and the machinery and apparatus necessary for the same, whereby the sewage manure is collected and conveniently exported for use, and the noxious effluvia prevented from contaminating the air of populous cities and towns, and whereby the drains may be more strongly and securely built, by the manufacture of a more suitable and better material.
1684. H. Jackson, 130, Fowis-street, Woolwich—Imp. in preparing lubricating matters.
1685. J. Hope, Rhode Island, U.S.—A new and useful mechanism or apparatus for supporting and adjusting a graver of a machine, for engraving the surface of a calico printer's roller, preparatory to the same being etched.
1686. J. Davies, Sergeant-Major, Royal Military College, Sandhurst—Imp. in cloaks for military and other purposes.
1687. P. A. Godefroy, 3, Kingsmead-cottages, New North-road, Islington—Imp. in the cleansing of gutta-percha, and in the more perfect insulation of electric telegraph wire.
1688. Henry Glover, New York, U.S.—Imp. in instruments for measuring angles and taking altitudes.

Dated 27th July, 1858.

1689. H. Ashton, Bewley street, Kirkdale—Imp. in the furnaces of steam boilers.
1690. J. Scott, Tain, N.B.—Imp. in pumps, which imps. are also applicable for the propulsion of ships, vessels, and boats.
1691. J. Emes, 110, Great Russell-street, Bloomsbury—A portable folding bedstead.
1692. T. Line, Lower Tower-street, Birmingham—Imp. in engines for raising beer and other liquids.
1694. C. N. Kottula, Liverpool—Imp. in the manufacture of soap.
1695. J. Long, Little Tower-street—Imp. in cooling brewers' and distillers' worts and other liquids.

Dated 28th July, 1858.

1698. A. Pougault, Decize (Nièvre), France—An improved apparatus for purging or clearing steam engines of their condensed water.
1700. R. Howarth, Slater Field Foundry, Bolton-le-Moors, Lancashire—Imp. in furnaces for steam boilers for the purpose of consuming smoke and economising fuel.
1702. W. A. Gilbee, 4, South-street, Finsbury—Imp. in the preparation of hydrated oxide of chromium. (A com.)
1704. J. Taylor, J. Lang, and J. Uttley, Castle Iron Works, Stalybridge, Chester—Imp. applicable to self-acting mules for spinning and doubling.
1706. J. Miles, Risca, Monmouthshire—Imp. in annealing pots used in the manufacture of iron, steel, and other metals.
1708. W. Buckingham, Broad-street, Bloomsbury, C. Humfrey, Camberwell, and L. R. Sykes, Duke-street, Manchester-square—Imp. in the construction of telegraphic cables.

Dated 29th July, 1858.

1710. G. Cavaggia and A. Spinelli, Avignon, France—Imp. in obtaining and applying motive power.
1714. J. Brierley, Kirkheaton, Yorkshire—Imp. in machinery or apparatus for spinning wool and other fibres.

Dated 30th July, 1858.

1716. J. F. W. Featherstonhaugh, Surrey square, Newington, and F. Wise, Peckham-grove, Camberwell—An improved self-acting apparatus for admitting water to steam-boilers, and indicating the water level.
1718. J. Luis, 18, Welbeck-street, Cavendish-square—An apparatus for cooling beer and other liquids. (A com.)
1720. G. W. Reynolds, Birmingham—A new or improved cradle.
1722. J. Watkins, Newport, Monmouthshire—Imp. in machinery or apparatus for the manufacture of tallow and other candles.
1724. H. Bessemer, 4, Queen-street-place, New Cannon-street—Imp. in the treatment of pit coal, and in the separation of foreign matters therefrom.
1726. J. Davey, H. Sims, J. Mayne, W. Hodge, and J. Gerrans, Gwennap, Cornwall—An improved construction of valve applicable to various descriptions of engines or machinery.
1728. N. S. Dodge, 44, St. Paul's Churchyard—Imp. in treating waste vulcanized india rubber. (A com.)

Dated 31st July, 1858.

1730. General H. Douglas, Bart., Green-street, Grosvenor-square—Imp. in freeing screw propellers from wreck or gear with which they may become entangled.
1732. W. C. S. Percy, Manchester—Imp. in arrangements and mechanism or apparatus for the manufacture of bricks, tiles, pipes, and other articles made of plastic earths.
1734. G. Davies, 1, Serle street, Lincoln's-inn—Imp. in apparatus for planing electrotypes and stereotype plates. (A com.)
1736. H. Conybeare, Abingdon-street, Westminster—Improved apparatus and machinery for the laying of submarine telegraph cables.
1738. G. T. Bousfield, Loughborough-park, Brixton—Imp. in knitting machines. (A com.)

Dated 2nd August, 1858.

1742. W. H. Crispin, Marsh Gate Lane, Stratford—Imp. in the construction of electric telegraph cables.
1744. J. W. Schlesinger, Red Grove House, South Lambeth—A new or improved machine for roasting and basting articles of food. (A com.)
1746. G. Davies, 1, Serle-street, Lincoln's-inn—Imp. in the manufacture of bituminous mastics. (A com.)
1748. C. Mortimer, South Carolina, U.S.—Imp. in apparatus for raising and lowering ships' boats. (A com.)
1750. J. L. Norton, Belle Sauvage-yard, Ludgate-hill—Imp. in apparatus for drying wool and other substances.
1752. H. Greaves, Westminster—Imp. in constructing streets, roads, and ways, thereby facilitating traffic and providing for the more convenient conveyance of sewage, drainage, gas and water supplies, and telegraphic wires along the same.

Dated 3rd August, 1858.

1754. W. Taylor, Titley-cottage, Kington, Herefordshire—An imp. in the manufacture of iron.
1756. T. Greenhalgh, Bury, Lancashire—Imp. in apparatus applicable to steam boilers.
1758. R. Cunningham, Paisley—Imp. in the production of letter press printing surfaces and surfaces used in reproducing ornamenting patterns or devices by printing or otherwise, and in the apparatus connected therewith.
1760. G. Bell, Fore-street—Imp. in embossing and printing dies, and in the manufacture of "lace" or perforated embossed paper.
1762. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in inkstands. (A com.)
1764. A. V. Newton, 66, Chancery-lane—Improved machinery for forging nails and other articles. (A com.)

INVENTION WITH COMPLETE SPECIFICATION FILED.

1696. G. Hurn, Norwich—Improving the manufacture of certain articles made from fibrous materials.—28th July, 1858.

WEEKLY LIST OF PATENTS SEALED.

August 14th.

- | | |
|--|----------------------------|
| 161. E. Hammond. | 344. W. Hall. |
| 304. W. Riddle. | 347. J. Potts. |
| 306. J. Fiddington. | 348. F. Puls. |
| 310. G. Claridge & R. S. Roper, F.G.S., F.C.S. | 354. E. Toynbee. |
| 313. H. Blair. | 356. G. F. White. |
| 314. F. Jones. | 386. A. J. Dessales. |
| 315. J. Beattie. | 390. D., R., and G. Nurse. |
| 316. W. Riley. | 481. G. Davies. |
| 323. J. E. Cook. | 482. H. Dauphin. |
| 324. W. Skallitzky. | 487. G. Davies. |
| 326. W. E. Nethersole. | 831. J. H. Johnson. |
| 330. H. Edwards. | 1042. W. C. Forster. |
| 333. F. M. Baudouin. | 1076. J. Hamilton. |
| 335. H. Rey-Rimels. | 1109. S. Higgs, jun. |
| 340. W. Betts. | 1168. P. Griffiths. |
| | 1249. A. V. Newton. |
| | 1261. T. and J. T. Crick. |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

August 9th.

1800. V. Delperdange.
1809. A. Heaven.
1812. G. Durham and C. Wat t.
1835. E. D. and G. Draper.
1838. A. and F. Thornton.
1864. W. and F. B. Fawcett.
1871. G. Collier.

August 10th.

1814. E. Finch.
1830. E. Topham.

August 12th.

1854. F. May.
1874. W. Sangster.
- August 13th.
1841. G. Sanders and R. E. Donovan.
1848. S. Statham and W. Smith.
1860. A. V. Newton.
1861. C. Rowley.
1867. W. E. Baker.
1875. R. Crawford.
1877. A. Savage.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
4111	August 7.	Improved Wet Gas Meter.....	W. H. Atkinson.....	Tynemouth.
4112	„ 18.	Safety Cab and Carriage Lamp	A. J. Clarke.....	Wolverhampton.
4112	„ 18.	The Atmospheric Hat	W. Gillett.....	Market-place, Hull.